DOCUMENT RESUME

ED 267 568 EC 182 089

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TITLE 16 PF Profiles of Academically Able High School Students.
PUB DATE 86
NOTE 16p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Gifted; High Schools; *Personality Traits; Psychological Characteristics; Student Characteristics

ABSTRACT

In an exploration of nonintellectual correlates of high ability among high school students, 112 high ability high school students attending the University of Arizona Precollege Program for Gifted and Talented Students were administered the Sixteen Personality Factor Questionnaire (16 PF). Mean primary factor scores of boys and girls were compared, and boys and girls were also compared with their respective 16 PF norms. Differences were found on several traits: girls scored higher on warmth and emotional sensitivity, while boys were higher in rebelliousness. Both boys and girls scored higher than norm groups with respect to the intelligence and dominance factor of the 16 PF. (Author/CL)

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16 PF PROFILES OF ACADEMICALLY ABLE HIGH SCHOOL STUDENTS

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ABSTRACT

A total of 112 high ability high school students attending the University of Arizona Precollege Program for Gifted and Talented Students were administered the Sixteen Personality Factor Questionnaire (16 PF). Mean primary factor scores of boys and girls were compared, and boys and girls were also compared with their respective 16 PF norms. Differences were found on several traits. Both boys and girls scored higher than norm groups with respect to the intelligence and dominance factor of the 16 PF.

INTRODUCTION

One of the interesting findings of Terman's famous longitudinal study of gifted individuals was that in many respects well-adjusted behavior was associated with superior intellectual ability. These findings have been confirmed by subsequent research where high ability students have been found generally to be more interpersonally effective and more socially mature than their age-mates. A review of the literature indicates that most studies concerning high ability or honors students' personality traits occurred in the 1960's (Karnes, Chauvin, & Trant, 1984). Baker (1966) found that honors students seemed to have greater aspiration level, student dignity, self-expression, and group life, than non-honor students. Gottsdanker (1968), and Kell and Kennedy (1966) reported the profile of academically gifted students included self-confidence, independence, purposefulness, and ambition. Whereas Demos and Weijola (1966) found that honors students were higher than non-honors students on responsibility, independence, and intellectual efficiency. Karnes, Chauvin, and Trant (1984) found that high achievement was associated with emotional stability, enthusiasm, and timidity. Haier and Denham (1976) found that the profile of gifted boys was virtually identical with that of gifted girls. When these two groups were compared with norms for boys or norms for girls, it was found that the superior student differed from their respective norms on certain personality traits. Boys were

higher than the norms in dominance, responsibility, independence, flexibility, and empathy. Girls were higher than norms in social presence, independence, intellectual efficiency, flexibility, and the girls were lower than norms in communality and feminity. These studies suggest that high ability boys and girls will have similar personality profiles, but their profiles will differ from students of average ability.

The purpose of this study was to examine nonintellectual correlates of high ability among high school students. Comparisons were made (a) between high ability boys and girls, (b) between high ability boys and national norms, and (c) between high ability girls and national norms.

METHOD

Subjects

A total of 112 high school students (39 boys and 73 girls) was enrolled in the University of Arizona Precollege Program for Gifted and Talented Students. Requirements for admission to the program were two recommendations from school officials and a GPA of 3.25. Because a score on an achievement or intelligence test was not required for admission, this study will refer to the participants in this program as high ability, high school students. The sample consisted of 7 Native Americans, 5 Blacks, 2 Asians, 6 Hispanics, and 92 non Hispanic Caucasians. A total of 99 had completed their junior year in high school, nine had completed Grade 10, and two had completed Grade 9. The mean age of the students was 16.5 (*SD* = .8), with a range from 12 to 18 years. The mean grade point average for the students was 3.7 (*SD* = .3).

Instrument

The Sixteen Personality Factor Questionnaire, Form A (16 PF; Cattell, Eber, & Tatsuoka, 1970) was developed using factor analysis to identify source traits of human personality. It consists of 16 essentially independent personality dimensions and four secondary personality factors. Reliability of the 16 PF has been found to range from .71 to .93. Validity coefficients ranged from .84 to .96 (Cattell et al., 1970). Further descriptions of the source

traits can be obtained from the test manual (Cattell et al., 1970) and Karson and O'Dell (1976). The 16 PF has become a widely used instrument (Adcock, 1959), although it has been subjected to serious criticism. Its reliability as a measure of individual differences has been questioned (Karson & Pool, 1957), yet its usefulness in the study of group differences has been recognized (Butcher, 1986). The traits have been described with bipolar adjectives (Cattell et al., 1970) and by single descriptors (Karson and O'Dell, 1976). Karson and O'Dell's descriptors of the 16 factors are (A) Warmth, (B) Intelligence, (C) Ego Strength, (E) Dominance, (F) Impulsivity (G) Group Conformity, (H) Boldness, (I) Emotional Sensitivity, (L) Suspiciousness, (M) Imagination, (N) Shrewdness, (O) Guilt Proneness, (Q1) Rebelliousness, (Q2) Self-Sufficiency, (Q3) Ability to Bind Anxiety, and (Q4) Free-Floating Anxiety.

Procedure

Subjects were administered the 16 PF in the summer of 1985 in small groups under normal conditions by one of the researchers. Testing procedures followed instructions of the 16 PF manual.

Data Analysis

This study utilized multivariate profile analysis (Harris, 1975; Johnson and Wichern, 1982; Powers and Lopez, in press) to compare the vector of trait means of boys with the vector trait means of girls. Profile analysis yields Hotelling's T^2 statistic which is a test of

the equality of two sample mean vectors. For many research problems in education and psychology, this is a particularly useful test since multivariate observations on subjects are the rule rather than the exception, and repeated univariate tests run the risk of increasing the probability of Type I errors from the battery of tests. In profile analysis, Hotelling's T^2 test is divided into three specific questions which are posed in stages: (a) Are the profiles parallel? (b) Assuming the profiles are parallel, are the profiles coincident? (c) Assuming the profiles are coincident, are the profiles level? Bonferroni comparisons were used to maintain the conventional .05 level of significance while making the 16 comparisons of the mean trait scores of boys and girls. In order to declare a *t* test significant, the probability level of a single comparison would have to reach .003 (i.e. .05/16). Normal curve *z* tests were used to compare the sample of high ability boys with the norms of the 16 PF of high school boys (IPAT, 1983) and to compare the sample of high ability girls to the 16 PF norms of high school girls (IPAT, 1983). As with the *t* tests, the nominal .05 level was maintained by requiring any *z* value to exceed the .003 probability level before declaring a contrast significant.

RESULTS AND DISCUSSION

A comparison of the profiles of high ability high school boys and girls yielded a T^2 statistic of 94.97, $F(15, 96) = 5.53$, $p < .001$. Hence the hypothesis of parallel profiles was decisively rejected. Since the tests for coincident and level profiles were contingent on nonsignificant findings of prior tests, no further overall comparisons of the mean vectors of boys and girls were carried out.

To find the personality traits on which high ability boys and girls differed, mean trait scores of boys and girls were compared with Bonferroni t tests (Refer to Table 1). Girls ($M = 11.03$) were higher than boys ($M = 8.77$) on Factor A (Warmth), $t(110) = 3.66$, $p < .001$. Girls ($M = 13.12$) were also higher than boys ($M = 8.97$) on Factor I (Emotional Sensitivity), $t(110) = 6.11$, $p < .001$. Boys ($M = 11.38$) were higher than girls ($M = 9.42$ on Factor Q1 (Rebelliousness), $t(110) = 3.18$, $p < .002$). Thus in general terms, girls might be described as more warmhearted, cooperative, sensitive than boys. The boys appeared to be more rebellious, experimenting, and freethinking than the girls.

Insert Table 1 about here

High ability boys were compared with the 16 PF norms (IPAT, 1983) using one-sample z tests and several significant differences

were found. High ability boys (M = 9.26) excelled the norm group (M = 7.04) on Factor B (Intelligence), z = 6.39, p <.001. Also boys (M = 15.26) excelled the norm group (M = 13.06) on Factor E (Dominance), z = 3.75, p <.001. Boys (M = 11.38) also scored higher than the norms (M = 9.72) on Factor Q1 (Rebelliousness), z = 3.40, p <.001. Boys appeared to be brighter than the norms, more dominant, assertive, and rebelliousness.

High ability girls (M = 9.22) scored higher than norms (M = 7.04) on Factor B (Intelligence), z = 8.58, p <.001. Girls (M = 13.84) scored higher than norms (M = 11.00) on Factor E Dominance), z = 5.56, p <.001. Girls (M = 17.82) scored higher than norms (M = 15.97) on Factor F (Impulsivity), z = 3.58, p <.001. Finally Girls (M = 10.60) scored higher than norms (M = 8.96) on Factor Q2 (Self-Sufficiency). On two factors girls scored lower than norms. Girls (M = 10.81) scored lower than norms (M = 12.16 on Factor G (Group Conformity), z = 3.30, p <.001. Girls (M = 8.40 also scored lower than norms (M = 10.33) on Factor N (Shrewdness, z = 6.04, p <.001. Like the boys, the girls were brighter than the norms and more dominant, more impulsive and enthusiastic. Further, they were more self-sufficient than the norms. With respect to Group Conformity and Shrewdness, girls were less shrewd and less group conforming. Intelligence and dominance are the two factors on which the high ability students were above the national norms. Using descriptive

terms from Karson and O'Dell (1976) a general profile of high ability high school boys and girls can be ascertained. Boys were higher than their norms in general mental capacity. They were more insightful, fast-learning, intellectually adaptable, assertive, independent minded, competitive, headstrong, than the norms. Boys were also higher than norms on experimenting, liberal and analytical personality facets. Girls, like the boys, were higher than their norms in general mental ability and dominance. In addition, girls were more impulsive, enthusiastic, cheerful, and talkative, self-sufficient, resourceful, and independent than their norms. Girls were less group-conforming, and less concerned with standards and rules, more naive, more spontaneous and genuine.

There were nine factors on which the high ability boys and girls are not differentiated from their respective norms. They were Factors A (Warmth), C (Ego-strength), H (Boldness), I (Emotional Sensitivity), L (Suspiciousness), M (Imagination, O (Guilt Proneness), Q3 (Ability to Bond Anxiety), and Q4 (Free-floating anxiety).

Clearly, both boys and girls were higher than their respective norms on Factor B (Intelligence) and Factor E (Dominance). It was expected that this select group of high ability students would exceed normative groups on intelligence since these students were specifically identified to be high ability (although not necessarily precocious) students. The dominance factor which the boys and girls

clearly shared is extensively described in Karson and O'Dell (1976). This factor describes people who like to dominate and control others. They like to be in command, to meet challenges. Factor B is important in interpreting E. With high B profile, the persons will have the high ability and be allowed the position of dominance whereas people low in B and high in E have a contradiction where, because of lower intelligence, they are not allowed the position of dominance. Karson and O'Dell point out that Factors B and E are often associated with Q1 (Rebelliousness) as this study has found for boys, and B and E are also found with Q2 (Self-Sufficiency) as this study has found with girls.

Although further research with high ability students is needed to validate the generalizability of these differences and the stability of these personality characteristics, these findings suggest clearly that high ability high school boys and girls differ from each other and from their respective national norms. These findings should aid researchers, teachers, and counselors to understand this select group. Additional studies, with different measures, are needed to further delineate this area of the high ability or honors student.

REFERENCES

Adcock, C. J. (1959). Review of the Sixteen Personality Factor Questionnaire. In O. Buros (Ed.), The Fifth Mental Measurement Yearbook. Highland Park, NJ: Gryphon Press.

Baker, S. R. (1966). A comparative study of perceptions of a university environment between honor and nonhonor freshman groups. Educational and Psychological Measurement, 26, 973-976.

Butcher, J. N. (1986). Review of the Sixteen Personality Factor Questionnaire. In J. V. Mitchell (Ed.), The Ninth Mental Measurement Yearbook. Lincoln, NE: University of Nebraska Press.

Catell, R. B., Eber, H. W., & Tasuoka, M. M. (1970). Handbook for the Sixteen Personality Factor Questionnaire (16 PF). Champaign, IL: Institute for Personality and Ability Testing.

Demos, G. D., & Weijola, M. J. (1966). Achievement personality criteria as selectors of participants and predictors of success in special programs in higher education. California Journal of Educational Research.

Gottsdanker, J. S. (1968). Intellectual interest patterns of gifted students. Educational and Psychological Measurement, 28, 361-366.

Haier, R. J., & Denham, S. A. (1976). A summary profile of the non-intellectual correlates of mathematical precocity of boys and girls. In D. P. Keating (Ed.), Intellectual Talent: Research and Development. Baltimore, MD: Johns Hopkins Press.

Harris, R. J. (1975). A primer of multivariate statistics. New York: Academic Press.

Institute for Personality and Ability Testing (IPAT). (1983). Tabular Supplement No. 1 Norms for the 16 PF, Forms A and B. Champaign, IL: Author.

Johnson, R. A., & Wichern, D. W. (1982). Applied multivariate statistical analysis. Englewood Cliffs, NJ: Prentice Hall.

Karnes, F. A., Chauvin, J. C., & Trant, T. J. (1984). Comparisons of personality factors and American College Test scores for university honor students. Educational and Psychological Research, 4, 111-114.

Karson, S., & O'Dell, J. W. (1976). A guide to the clinical use of the 16 PF. Champaign, IL: Institute for Personality and Ability Testing.

Karson, S. & Pool, K. B. (1957). The construct validity of the Sixteen Personality Factor Test. Journal of Clinical Psychology, 13, 245-252.

Kell, L., & Kennedy, C. E. (1966). Attitude change in honors students between freshman and junior years. Journal of Home Economics, 58, 671-673.

Powers, S., & Lopez, R. L. (in press). A computer program to perform a multivariate profile analysis. Educational and Psychological Measurement.

Table 1

Mean Personality Factor Scores of the 16 PF High Ability Boys and Girls

	Boys		Girls		
	M	SD	M	SD	t
Factor A (Reserved-Outgoing)	8.77	2.67	11.03	3.33	3.66**
Factor B (Less intelligent-More intelligent	9.26	2.10	9.22	2.29	.08
Factor C (Affected by feelings-Emotionally stable)	15.36	3.91	14.34	3.93	1.31
Factor E (Humble-Assertive	15.26	3.60	13.44	4.17	2.30
Factor F (Sober-Happy-go-lucky)	16.36	4.24	17.82	4.82	1.59
Factor G (Expedient-Consientious)	10.97	3.44	10.81	3.86	.23
Factor H (Shy-Venturesome)	13.67	6.23	13.64	5.90	.02
Factor I (Toughminded-Tenderminded)	8.97	4.02	13.12	3.06	6.11**
Factor L (Trusting-Suspicious)	9.90	3.32	9.71	3.52	.27
Factor M (Practical-Imaginative	11.69	2.50	10.97	3.36	1.17
Factor N (Forthright-Astute)	8.03	2.50	8.40	2.85	.69
Factor O (Self-assured-Apprehensive	11.10	3.95	12.79	3.99	2.15
Factor Q1 (Conservative-Experimenting)	11.38	2.84	9.42	3.24	3.18*

Factor Q2 (Group Dependent-Self-sufficient)	11.72	3.39	10.60	3.36	1.67
Factor Q3 (Undisciplined Self-conflict-Controlled	11.64	3.38	11.07	3.36	.86
Factor Q4 (Relaxed-Tense)	12.85	4.94	15.77	5.23	2.87*

Note. The factors are named by popular terms which broadly describe the source traits of the 16 PF.

*$p < .01$ **$p < .001$.